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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/013,087

12/07/2001

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1427

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7590

03/07/2006

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EXAMINER

SCHILLINGER, LAURA M

ART UNIT

PAPER NUMBER

2813

DATE MAILED: 03/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/013,087

Applicant(s)

ANDOH, HIDEYUKI

Examiner

Laura M. Schillinger

Art Unit

2813

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 December 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>12/24/05</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Allowability is hereby withdrawn, in view of newly discovered prior art.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Yanagisawa (JP 58-085572).

In reference to claim 1, Yanagisawa teaches a device comprising:

A first semiconductor region of a first conductivity type, defined by an upper end surface and a side boundary surface connecting the upper and lower end surfaces when viewed in section (Fig.D (16));

A second semiconductor region of the first conductivity type disposed under the first semiconductor region and being in contact with the lower end surface of the first semiconductor region so as to share a common boundary surface by the first and second semiconductor regions (Fig.D (12));

A third semiconductor region of a second conductivity type disposed on the first semiconductor region and being in contact with the upper end surface of the first semiconductor region (Fig.D (18)); and

A fourth semiconductor region having inner surface in contact with the first and second with th side boundary surface when viewed in section and an impurity concentration lower than the first semiconductor region, configured such that the fourth semiconductor region is disposed between the second and third semiconductor regions (Fig.D (13)) (see abstract).

In reference to claim 2, Yanagisawa teaches wherein the fourth semiconductor region has a first type conductivity (Fig.D (13)).

In reference to claim 3, Yanagisawa teaches wherein outer surface of the fourth semiconductor region serves as a chip outer surface of the semiconductor device and the chip outer surface is substantially orthogonal with the lower end surface of the first semiconductor region (Fig.D (13)).

In reference to claim 4, Yanagisawa teaches wherein the fourth semiconductor region is made of a wafer cut from bulk crystal (inherent- semiconductor substrates are made from wafers cut from bulk crystal).

In reference to claim 5, Yanagisawa teaches further comprising a first main electrode layer is formed on a bottom surface of the second semiconductor region (Fig.G (21)).

In reference to claim 6, Yanagisawa teaches wherein the first main electrode layer is contacted with the second semiconductor region, through a first concavity formed at the bottom surface of the second semiconductor region (Fig.G (21)).

In reference to claim 7, Yanagisawa teaches further comprising a first main electrode layer, a part of the first main electrode layer is buried in a via hole penetrating through the second semiconductor region, configured such that the buried part of the first main electrode layer contacts with the first semiconductor region (Fig.G (21)).

In reference to claim 8, Yanagisawa teaches further comprising a second main electrode layer is formed on a top surface of the third semiconductor region (Fig.G (20)).

In reference to claim 9, Yanagisawa teaches wherein the second main electrode layer is contacted with the first semiconductor regions, through a second concavity formed at the top surface of the third semiconductor region (Fig.G (20)).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura M. Schillinger whose telephone number is (571) 272-1697. The examiner can normally be reached on M-T, R-F 7:00-5:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl W. Whitehead, Jr. can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Laura M Schillinger', with a stylized, flowing script.

Laura M Schillinger
Primary Examiner
Art Unit 2813

02/27/06